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<b>Application Number</b>		Application for (a-urban, b-agriculture, c-DWR/WUE:	
170		a) Prop 13 Urban Water Conservation	
Principle Applicant( Organization/Affiliation)			
Desert Water Agency			
Project Title			
Palm Canyon Recycled Water Expansion			
<b>First Name-Authorized</b>		<b>Last Name (AA):</b>	<b>Title</b>
Dan M.		Ainsworth	General Manager
Street Address		PO Box	
		1710	
City		State	
Palm Springs		CA	
Zip Code		Telephone Number(Include Area Code)	
92263		(760) 323-4971	
Fax Number (Include Area Code)		E-mail Address	
(760) 325-6505		dainsworth@dwa.org	
<b>First Name-Contact Per</b>	<b>Last Name-CP:</b>		<b>Contact-Title</b>
Contact-Street Address		Contact-PO Box	
Contact-City		Contact-State	
Contact-Zip Code		Contact-Phone Number	
Contact-Fax Number		Contact-E-Mail Address	
Funds Requested (dollar amount)	Applicant Funds Pledged (dollar amount)	Total Project Costs (dollar amount)	
\$4,000,000.00	\$0.00	\$4,000,000.00	
Estimated Total Quantifiable Project Benefits (dollar amount)		Percentage of Benefits to be Accrued by App	
Percentage of Benefits to be Accrued by CALFED or other		Estimated Annual Water to be Saved (acre-fe	
		1175	
Estimated Total Amount of Water to be Saved (acre-fee		Over _____ Number of Years	
23500		20	
Estimated Benefits to be Realized (terms of water qual,instream			
Nitrate Reduction in groundwater			
Duration of Project (month/year-month/year):		State-Wide	
06/02-06/03		<input type="checkbox"/>	
State Assembly District-location of project(	80	State Senate District-location of project(1	37
State Assembly District-location of project(		State Senate District-location of project(2	
State Assembly District-location of project(		State Senate District-location of project(3	
State Assembly District-location of project(		State Senate District-location of project(4	
State Assembly District-location of project(		State Senate District-location of project(5	
State Assembly District-location of project(		State Senate District-location of project(6	
State Assembly District-location of project(		State Senate District-location of project(7	
State Assembly District-location of project(		State Senate District-location of project(8	
State Assembly District-location of project(		State Senate District-location of project(9	
State Assembly District-location of project(		State Senate District-location of project(10	

Congressional District(s)-location of project	44	Congressional District(s)-location of project(	
Congressional District(s)-location of project		Congressional District(s)-location of project(	
Congressional District(s)-location of project		Congressional District(s)-location of project(	
Congressional District(s)-location of project		Congressional District(s)-location of project(	
Congressional District(s)-location of project		Congressional District(s)-location of project(1	

County-location of project		Most recent Urban Water Mgt Plan Submitt	
Riverside		12/19/2000	
Type Applicant-Urban(a)Agricl Feas Study(b) Gra	DWR WUE Projects	Project Focus	
e) other-subdivision of state(include public water)		b) Urban	
Project Type:			
d) other- specify			

### Quantifiable Objectives

Specify from choice (d) above
Reduction of groundwater overdraft utilizing water recycling
Specify from (k) above
Does Proposal involve change in land use (planned/future)ICheck box if yes
<input checked="" type="checkbox"/>

# PROPOSAL PART TWO

## **PROJECT SUMMARY**

The project consists of constructing approximately 13,000 feet of recycled water pipeline, and associated 2.0 MG storage reservoir, from the Desert Water Agency's 10 MG recycling facility to serve the Canyon South Golf Course in Palm Springs (see Appendices 2 and 3 - Project Location Map and Recycle Facilities Map). Additionally, construction of the pipeline would allow both the Canyon North Golf Course and Seven Lakes Country Club the opportunity to begin utilizing recycled water for irrigation of their large turf/greenbelt areas. An agreement for recycled water service has been entered into with one of the potential users – Canyon South Golf Course, and with service provided to that course, it will become the first Native American Indian (Agua Caliente Band of Cahuilla Indians) owned golf course in California to use recycled water for irrigation.

The Desert Water Agency is a non-profit special district created by an act of the California State Legislature on September 15, 1961. Agency boundaries encompass 325 square miles, and include the cities of Palm Springs and Cathedral City.

Initially, Desert Water Agency was formed for the sole purpose of contracting for imported water from the California State Water Project to offset a declining water table caused by increased pumping requirements. Since its formation, the Agency's responsibilities have expanded, significantly.

Today, the Agency's primary goal is to provide its customers with a continued, ample, high quality supply of safe drinking water. In direct relation to this goal is the management of the underlying groundwater basin, from which the Agency obtains 90% of its water supply.

Despite the importation of water from the Colorado River Aqueduct, via an exchange agreement with the Metropolitan Water District of Southern California, the basin remains in a state of overdraft.

In an effort to reduce groundwater overdraft, conserve energy, and protect the existing groundwater from increased nitrate pollution, the Agency constructed a water recycling facility in 1988. The facility produces tertiary treated water, which is sold at reduced rates to large water users for irrigation purposes.

At present, all three of the developments listed rely on pumped groundwater for their irrigation needs. Construction of this project will reduce the amount of groundwater pumped by an estimated 1,180 acre feet per year.



The total estimated cost of the project is \$4.0 million. The quantitative charge for all recycled water delivered to the potential users will be \$120 per acre foot, while the unit cost to produce recycled water during the fiscal year 1999-2000 was \$191.66 per acre-foot.

As shown, the cost to produce recycled water exceeds that of the amount charged to customers. Efforts are underway to reduce operating costs, thereby bringing these figures closer in line.

Despite this cost difference, Desert Water Agency feels it is in the best interest of the public to retain the price of recycled water at approximately one-half its domestic rate, and strive to reduce operating costs, while realizing economies of scale as more customers come on line.

Additionally, keeping the cost of recycled water low allows it to be competitive with that of private well operations; this serves as an incentive for customers to connect to the recycled water system, thereby reducing the demand on the aquifer.



**A. Scope of Work: Relevance and Importance**

- 1. Nature, Scope and Objectives; and**
- 2. Statement of Critical Water Issues**

Responsibilities

As previously stated, the Agency was formed in 1961 for purposes of contracting for State Water Project water to offset a declining water table. Since that time, its responsibilities have expanded to include furnishing domestic water, sanitary sewer service, hydroelectric power generation, and recycled water.

Desert Water Agency is also responsible for groundwater replenishment and management within its boundaries. As a contractor of the State Water Project, the Agency has secured an entitlement for additional water supplies. To defer the cost of construction of a local aqueduct, the Agency's entitlement is being delivered to Metropolitan Water District of Southern California in exchange for Colorado River water delivered to the Agency from the Colorado River Aqueduct. Water imported from the Colorado River Aqueduct is being used for groundwater replenishment of the Whitewater River Subbasin, as a part of the Agency's Basin Management Program. Despite artificial recharge, the groundwater basin remains in a state of overdraft.

Groundwater Overdraft

Since 1973, Desert Water Agency has replenished the Whitewater River Subbasin with imported water from the Colorado River Aqueduct. Groundwater overdraft is, therefore, being reduced by the amount of imported water being percolated. The Agency's present allotment of imported water is 38,100 acre feet per year.

Despite the importation of water, the upper Whitewater River Subbasin is, and will remain, in a condition of overdraft. Cumulative overdraft within the Subbasin will exist with or without further development; however, overdraft will increase more rapidly with continued development. The groundwater subbasin is being depleted since it is not being sufficiently replenished to recover completely. The extent of future annual overdraft will depend on consumer demands and uses, conservation practices, and on the availability of supplies of natural and imported water for groundwater recharge.

Continued groundwater overdraft will increase pump lifts (depths to recoverable groundwater) and the energy required to extract groundwater, and may also cause ground surface settlement and groundwater storage



volume reduction (due to aquifer subsidence). Water quality could be adversely affected if basin conditions (groundwater gradients and groundwater flowlines) are altered by continued groundwater overdraft. Groundwater replenishment and additional groundwater management practices, such as water recycling, are without question needed to arrest or reduce declining water levels, and to avoid the detrimental conditions that could result therefrom.

### Water Recycling

Recycling wastewater for irrigation purposes reduces groundwater overdraft by the equivalent amount of water reclaimed. This is having a direct, positive affect on groundwater levels.

In terms of basin water quality, because it is processed wastewater, the finished product is high in nitrates. This is of benefit to our customers, as applying recycled water to landscaping and turf reduces the amount of nitrogen fertilizer required for healthy plant growth. Thusly, fertilizer cost savings are realized when recycled water is used for irrigation (for reference, an Effluent Water Quality Analysis is contained in Appendix 1).

Additionally, basin water quality is benefited through the use of recycled water. The City of Palm Springs operates a wastewater treatment plant which provides treatment through the secondary level. The secondary treated sewage that is not utilized by Desert Water Agency's tertiary facility is discharged into city-owned percolation ponds, with the discharge ultimately reaching the groundwater. This situation was causing high nitrate levels in groundwater downstream of the City's plant (twice that of the MCL). These nitrate levels have been cut in half since Desert Water Agency's tertiary treatment facility came on-line in 1988. In addition, nitrate levels in Desert Water Agency's producing wells have decreased overall since recycling operations began. Maintaining existing groundwater quality remains a key focus of Desert Water Agency's water recycling efforts as present groundwater contains low concentrations of nitrates (well below state and federal standards).

The golf course economy plays a major role in the Palm Springs area, and with many more golf courses currently in the design or construction stages within the Coachella Valley, water availability and cost will continue to play a part in their development.

The previously described existing golf courses presently utilize pumped groundwater for irrigation purposes. The utilization of valuable groundwater for irrigation is not in keeping with the Agency's water management goal of reducing overdraft. Construction of this project is, therefore, supported by the





Agency's staff and Board of Directors as an effective means of reducing groundwater overdraft.

### Project Description

The project consists of the engineering, design and construction of approximately 13,000 feet of 24-inch cement mortar-lined ductile iron pipe, along with a 2.0 MG welded steel storage reservoir. The majority of the project will be constructed in existing paved streets, with some portions necessitating construction in areas paralleling and within the Palm Canyon Wash in Palm Springs (see Appendices 2 and 3 for project location maps).

Construction in the unimproved areas will involve securing easements from private landowners, and the Riverside County Flood Control and Water Conservation District. All installations will be per Desert Water Agency specifications.



**B. Scope of Work: Technical/Scientific Merit, Feasibility, Monitoring and Assessment**

**1. Methods, Procedures, and Facilities**

Water Supply characteristics and Facilities

a) Wholesale and Retail Water Entities & Sources of Water

Golf course irrigation for projects currently neighboring the proposed pipeline is supplied by groundwater pumped from private wells. These wells are owned and operated by each producer, and are separate from DWA's domestic and recycled water systems.

Desert Water Agency Law empowers Desert Water Agency to levy and collect water replenishment assessments within its area of jurisdiction. Producers that extract or divert 10 AF of water or less in any one year are considered minimal producers and their production is exempt from assessment. Water produced from all private wells serving properties anticipated to receive benefit from the proposed pipeline project is metered for the purpose of accurately charging replenishment assessments. The replenishment assessment for F.Y 2001/2002 is \$33.00 per acre foot of water produced.

A water production cost estimate has been performed by DWA for the Canyon South Golf Course. The cost estimate uses a fixed well construction cost of \$250,000, and is as follows:

Production .....	1,000 AF/yr
Power Requirements .....	450 kwh/AF
Power Cost .....	\$0.10/kwh
Labor .....	\$30,000/yr

Estimated Cost Per Acre Foot of Water Pumped:

Power .....	\$45.00/AF
DWA Replenishment Assessment.....	\$35.00/AF
Capital Recovery (9%, 15 year).....	\$30.00/AF
Well Plant Maintenance .....	\$3.00/AF
Labor .....	\$3.00/AF
Fertilizer .....	<u>\$15.00/AF</u>
<b>Total Estimated Cost per Acre Foot .....</b>	<b>\$131.00 AF</b>
(Privately Pumped Well Water)	



**Note:** DWA feels that the above cost estimate is also representative of the acre foot costs incurred by Canyon North Golf Course and Seven Lakes Country Club.

b) Description of Major Facilities:

Desert Water Agency owns and operates a state-of-the-art 10 MGD water recycling facility. The recycling facility produces tertiary treated irrigation water from secondary effluent received from the City of Palm Springs' trickling filter sewage treatment plant.

The water recycling plant utilizes advanced water treatment through the use of chemical additions, flocculation, clarification, filtration, and disinfection. The water produced is approved for human body contact, and all types of uses, except drinking, per Title 22 of the California Code of Regulations. This includes irrigation of landscaping and many types of food crops, commercial laundries, industrial applications, as well as many others.



Splitter towers at DWA's 10 MGD  
Water Recycling Facility



Recycled water is injected with chlorine to  
prevent the growth of bacteria



100 HP pump motors help deliver tertiary  
treated water to DWA customers



### c) History

As stated in Section I of this document, the groundwater basin from which the Agency obtains approximately 90% of its supply is in a state of long-term overdraft, despite recharge with imported water. The Agency's Board of Directors and Staff feel strongly that recycling wastewater for irrigation purposes is essential in reducing the amount of overdraft taking place.

With this in mind, DWA and the City of Palm Springs (City) entered into a "Water Conservation and Reclamation Agreement" in 1977. Its purpose was to better integrate, expand, and improve the conservation efforts of the community, to further the cooperation and coordination between the parties, and to acknowledge a joint dedication to these common goals. Subsequently, a second agreement between DWA and the City was executed in 1985. This agreement outlined the construction and operation of a DWA owned and operated water recycling facility. Finally, a Memorandum of Understanding was signed by the two parties in June of 1985, detailing certain rights, service connections and plant operations.

As a result of these documents, Phase I of DWA's ultimate 15 million gallon per day (MGD) water recycling facility became operational in September 1988. The facility, which was initially constructed to a capacity of 5 MGD, performs tertiary treatment on secondary treated wastewater furnished by the City of Palm Springs' Wastewater Treatment Plant.

As a result, highly treated irrigation water is delivered to golf courses, parks and green belts, which preserves the limited potable groundwater supply and also protects the quality of the groundwater. The facility underwent expansion in 1995, and is now capable of treating up to 10 MGD.



**Golf courses typically store recycled water in lakes, then pump it through their irrigation systems as needed (Palm Springs Municipal Golf Course)**

This highly treated water is produced through the use of chemical addition, flocculation, clarification, filtration, and disinfection. Following treatment, the water is approved by the California Department of Health Services for nearly all uses and forms of human contact, except



drinking. This includes, but is not limited to, the irrigation of food crops, parks, golf courses, and residential landscaping.

The facility was designed with operating efficiency foremost in mind. It operates basically as an unmanned site, whose needs continue to be met without hiring additional personnel. All facets of the process are controlled by computer.

#### d) Recycling Facility Specifications

Purpose: To produce irrigation water from secondary effluent from the City of Palm Springs' trickling filter sewage treatment plant by providing advanced wastewater treatment through the use of chemical addition, flocculation, clarification, filtration, and disinfection

Cost: Phase I - \$9,000,000 (on line September, 1988)  
Phase II - \$3,000,000 (on line August, 1995)

Plant Capacity: Phase I – 5,000,000 gallons per day  
Phase II – 10,000,000 gallons per day  
Ultimate – 15,000,000 gallons per day

Treatment Criteria: Title 22, Article 4, Section 60313b of the California Code of Regulations; Suitable for body contact (overspray onto private properties adjacent to golf courses)

- Treatment Facilities – Phase I and II:
- Influent equalizing reservoir – 2.0 MG
- Reclaimed water storage and chlorine contact reservoirs – Two (2) 2.3 MG, with inlet/outlet diffusers to inhibit short circuiting and enhance chlorine contact
- Pump building, with vertical turbine influent, effluent, backwash, and surface wash supply pumps
- Chlorine building with 2,000 ppd chlorinators
- Operations building



- Trident (clarifier/filter) complex:
  - 1) Two Mix/Floc/Splitter structures with submersible flocculation mixer
  - 2) Chemical room, for dilution and distribution of alum and polymer
  - 3) Control room
  - 4) 6 microfloc “Trident” adsorption clarifier/filter modules;
    - Adsorption clarifiers provide clarification by upward flow through granular plastic media
    - Filters are stratified-bed “mixed media” type
- Backwash holding tank with submersible mixers, backwash recycle, and backwash waste pumps
- Backwash clarifier for recycling backwash

#### Current Connected Users:

Mesquite Country Club .....	1,100 acre feet/year
P.S. Muni. & Tahquitz Creek Golf Courses ...	2,240 acre feet/year
Demuth Park .....	400 acre feet/year
Mid-Valley Parkway Median Strips .....	9 acre feet/year
DWA Tertiary Recycling Facility.....	23 acre feet/year
DWA Operations Center .....	42 acre feet/year

#### Community Benefits:

- Conservation of high quality groundwater
- Reduced nitrate pollution of groundwater (reuse avoids costly nitrate removal at well heads)
- Energy conservation (private well operations consume approximately four times as much power for a given amount of delivered groundwater as delivered reclaimed water)
- Reduced irrigation and fertilizer costs to local golf courses, parks and green belts



e) Water Quality of Influent/Effluent

The physical make-up of the secondary treated wastewater supplied by the City of Palm Springs Wastewater Treatment Plant does not change appreciably as it passes through Desert Water Agency's tertiary recycling facility (copies of influent and effluent water analyses are contained in Appendix 1). The quality remains relatively consistent throughout the year as well.

f) Additional Facilities Required

Desert Water Agency's water recycling facility meets all waste discharge requirements as issued by the California Regional Water Quality Control Board, Colorado Basin Region.

All water discharge requirements applying to golf course and landscape irrigation are the responsibility of the parties served and therefore will be met by them, as such.

g) Sources of Problem Constituents and Control Measures

Both the influent and effluent waters described in this report contain no problem constituents, and, hence, no control measures are necessary.

h) Existing Recycling

1) Special Potential Uses of Recycled Water

Desert Water Agency studies indicate that due to the climatic conditions experienced within our service area, as much as 80% of all residential water used may be for landscape irrigation. Therefore, the majority of our conservation efforts are directed toward landscape irrigation. Foremost among these is the aggressive pursuit of recycled water customers.

When recycled water is used for irrigation, it directly conserves an equivalent amount of groundwater. This results in a reduction in groundwater overdraft, reduced reliance on imported State Water Project water, as well as a potential decrease in the amount of nitrates reaching the groundwater. Due to these benefits, recycling water for irrigation is viewed by this Agency as its most effective use at this time, and therefore, no other uses of recycled water are currently being pursued.





## 2) Locations of Recycled Water Users

### Customer Base

The Agency currently serves six locations with tertiary treated recycled water for irrigation purposes. They are as follows:

- Desert Water Agency Operations Center
- Desert Water Agency Recycling Facility
- Palm Springs Municipal Golf Course (36 holes)
- City of Palm Springs Demuth Park
- Mesquite Country Club Golf Course (18 holes)
- Mid-Valley Parkway Median Strips

### Potential Customers

It is anticipated that with the Agency's proactive approach to obtaining new customers, seven additional locations may be served with recycled water prior to 2005. They are as follows:

- PS Unified School Dist. - P.S. High School Campus
- Canyon South Golf Course – Palm Springs
- Seven Lakes Golf Course – Palm Springs
- Ritz Carlton Golf Course – Cathedral City (not yet constructed)
- Classic Golf Course – Palm Springs (not yet constructed)
- Canyon North Country Club Golf Course – Palm Springs
- Cathedral Canyon Country Club Golf Course – Cathedral City

The pipeline constructed under this grant funded project would provide recycled water service to Canyon South Golf Course, Canyon North Country Club, and Seven Lakes Golf Course. In addition, the Agency currently holds signed agreements to provide recycled water to all of the potential customers listed above (excepting Seven Lakes, Canyon North Golf Course and the Cathedral Canyon Country Club Golf Course), with agreements pending the construction of recycled water pipelines. (Seven Lakes, Canyon North Golf Club and Cathedral Canyon Country Club have expressed interest in obtaining recycled water and will likely sign contracts once the pipelines have been constructed).

For the specific locations of the above sites, please reference the recycle facilities map found in Appendix 3 of this document.





### 3) Present and Future Quantity Needs

Historical Recycled Water Use (listed in million gallons)						
1998 Usage	Mesquite Country Club	P.S. Municipal Golf Course	Demuth Park	Mid-Valley Parkway	Desert Water Agency Site Uses	TOTAL
TOTAL	179.73	540.72	92.83	not constructed	9.24	822.52
1999 Usage	Mesquite Country Club	P.S. Municipal Golf Course	Demuth Park	Mid-Valley Parkway	Desert Water Agency Site Uses	TOTAL
TOTAL	240.40	578.59	116.84	0.72	10.18	946.73
2000 Usage	Mesquite Country Club	P.S. Municipal Golf Course	Demuth Park	Mid-Valley Parkway	Desert Water Agency Site Uses	TOTAL
TOTAL	214.98	556.24	163.78	2.76	22.59	960.35

Projected Recycled Water Needs		
YEAR	NO. OF CUSTOMERS	USAGE (million gallons/year)
2005	12	1,955
2010	16	2,607
2015	17	3,258
2020	17	3,258

### 4) Contractual Agreements

All potential users are required to enter into an agreement for recycled water. The agreement spells out the specific terms and conditions which must be met before recycled water service can begin.

Included is the quantitative charge for recycled water delivered, which is typically \$150 per acre foot. In the case of Canyon South Golf Course project, the cost has been set at \$120 per acre foot for the first five years of operation. The reduced rate serves as an incentive to utilize recycled water for irrigation. In addition, as a further incentive, DWA has waived the back-up facility charge (a charge typically paid by developers as a means of securing funds for future transmission facilities), which amounts to approximately \$250,000.

Copies of all agreements currently held regarding the use of recycled water are found in Appendix 4.



## Recycled Water Market

### a) Market Assessment

Desert Water Agency studies indicate that due to the climatic conditions experienced within our service area, as much as 80% of all residential water used may be for landscape irrigation. Therefore, the majority of our conservation efforts are directed toward landscape irrigation. Foremost among these is the aggressive pursuit of recycled water customers.

When recycled water is used for irrigation, it directly conserves an equivalent amount of groundwater. This results in a reduction of groundwater overdraft, reduced reliance on imported State Water Project water, as well as a potential decrease in the amount of nitrates reaching the groundwater. Due to these benefits, recycling water for irrigation is viewed by this Agency as its most effective use at this time, and therefore, no other uses of recycled water are currently being pursued.

### b) User Descriptions

All locations currently utilizing recycled water for irrigation contain large landscaped areas. These areas may include turf or other types of landscaping. Typically, they consist of golf courses or park settings. A list of all present and proposed users is found on page 12 of this document.

### c) Expected Annual Recycled Water Use

Expected annual water use for the three projects which are anticipated to benefit immediately from the construction of this project are shown on page 21 of this document. In addition, a projection of recycled water needs through the year 2020 is contained on page 13.

### d) Estimated Capital Investment

Typically, golf courses within the Agency's service area obtain their irrigation water by constructing on-site private wells as opposed to utilizing water from the Desert Water Agency's domestic water system. When this is done, the user pays all costs associated with constructing and maintaining the well, along with a monthly groundwater replenishment assessment, paid to Desert Water Agency and based on the amount of water extracted.



As this is the case, the on-site systems are separate from the potable system. This allows customers to connect to DWA's recycled water system with minimal modifications and costs.

Some additional modifications to DWA's existing 10 MGD recycling facility will be necessary in conjunction with this project. The estimated cost for said modifications is \$530,000.

e) Needed Water Cost Savings – Desire to Utilize Recycled Water

As has been detailed in previous sections of this document, DWA has entered into an Agreement with the Canyon South Golf Course to provide recycled water service at a cost of \$120 per acre foot.

Additionally, this Agency is in discussion with two well established projects desiring to utilize recycled water. The Canyon North development is an existing 18-hole golf course bordered by single family homes. Additionally, Seven Lakes Golf course, which consists of an 18-hole golf course within a condominium development, is desirous of utilizing recycled water for irrigation.

These two projects will begin utilizing recycled water for irrigation as soon as it becomes available to them.

The golf courses utilizing this pipeline for service will experience system pressures of 60 to 100 psi.

Planning and Design Assumption

a) Peak Delivery Criteria

The peak flow design criteria used for this project is 4,000 GPM.

b) Storage Criteria

The reservoir storage of 2 million gallons was determined using a maximum plant production of 10 MGD. This figure also considers plant operational patterns utilizing an energy saving time-of-use rate schedule. The high water elevation of the proposed welded steel reservoir is 550 feet above sea level.



c) Cost Basis

See Appendix 5 for a listing of all projected revenue and expenses in Year 2001 dollars

d) Planning Periods

Initial Engineering planning began in May of 2000. The estimated date of completion of final facilities planning (including environmental documents) is December 2001.

Water Recycling Alternatives to be Evaluated

a) Treatment Alternatives:

(1) Alternative Levels of Treatment

The California Regional Water Quality Control Board, Colorado River Basin, specifies in its Waste Discharge Requirements that only tertiary treated wastewater, as defined in Title 22 of the California Code of Regulations, shall be accepted and used as recycled water. Therefore, there are no alternative levels of treatment.

(2) Alternative Unit Processes to Achieve a Given Level of Treatment

Following an extensive pilot project performed by DWA during the mid-1980's, it was determined that the chemical/absorption clarifier method of treatment is the most cost effective system for producing the quality of tertiary treated water necessary. Desert Water Agency's 10 MGD facility is in operation, and it would not be cost effective to consider alternatives at this time.

b) Pipeline Route Alternatives

As previously described, the project will be constructed in portions of existing paved streets, Palm Canyon Wash levy, and within the Palm Canyon Wash in Palm Springs, California (see Appendix 2 of this document for a project location map). This route is the result of prior discussions and analysis. It has been deemed the most feasible and cost effective routing option, and hence, no other route alternatives are being considered at this time.



c)      Alternative Markets

The basin management goals of Desert Water Agency are best met through the use of recycled water for large scale irrigation purposes. This use is strongly supported by the Agency's Board of Directors and Staff. Therefore, no other alternative markets are being sought at this time.

d)      Alternative Storage Locations

The 2.0 MG storage reservoir to be constructed with this project will be located just south of the Canyon South Golf Course at the base of the Santa Rosa Mountains. Taking into account the required elevation and need to place a storage reservoir in close proximity to the golf course being served, there are no alternative storage locations.

e)      Sub-alternatives of Selected Alternative

Contained in each recycled water agreement is a clause stating that if recycled water cannot be provided at any given time, potable water will be substituted at an equivalent rate.

Agency Staff and consulting Engineers have previously analyzed this project and determined the necessary pumping requirements, storage capacity, and pipeline sizing and therefore no other sub-alternatives exist.

Non-recycled Water Alternatives

Golf course irrigation for projects currently neighboring the proposed pipeline is supplied by groundwater pumped from private wells. This method of irrigation continues to add to the amount of groundwater overdraft occurring, and is neither in keeping with the Desert Water Agency's Groundwater Management practices, nor in the best interest of the residents of the Coachella Valley. If Desert Water Agency is unable to supply recycled water to this area, pumped groundwater will continue to be utilized for irrigation. Therefore, no non-recycled water alternatives exist.



**2. Task List, Schedule, and Quarterly Expenditure Projections**

- a. Please see Appendix 9 for task list and work schedule chart



**2. Task List, Schedule, and Quarterly Expenditure Projections (cont.)**

b. Please see Appendix 10 for Quarterly Expenditure Projections



## **2. Task List, Schedule, and Quarterly Expenditure Projections (cont.)**

### **c. Deliverable Items/Due Date**

As of this writing, facilities planning has not been completed. Several issues have contributed to this. Those issues include, primarily, changes to the DWA recycled water Master Plan configuration, and environmental considerations.

Therefore, until final planning has been completed (estimated completion date is May 1, 2002), plans and specifications cannot be issued. This, of course, makes it impossible to predict due dates for items such as pipeline delivery, etc., at this time.

As the project progresses, DWA will revise the project schedule to include more detailed information, as it becomes available.





### 3. Monitoring and Assessment

The success of this project, and the Agency's water recycling program in general, will be measured primarily in terms of the amount of wastewater reclaimed. This is a quantifiable figure which relates directly to the number of users, and influences the quantity and quality of available groundwater.

To reiterate, the overall goal of DWA's water recycling program is to reduce groundwater overdraft, protect existing groundwater from nitrate pollution, and conserve electrical energy used for well pumping operations.

#### a) Annual Production

The expected reduction in pumped groundwater is as follows, and represents an average of annual production taken from a ten-year period dating from 1991 to 2000:

Canyon South Golf Course .....	459.38 AF/year
Canyon North Golf Course .....	504.28 AF/year
Seven Lakes Country Club .....	213.00 AF/year

The actual annual production will be obtained from monthly meter readings, and will be recorded on computer generated spreadsheets.

#### b) Nitrate Concentrations

The Agency is also tracking the amount of nitrates present in monitoring and production wells in the vicinity of the Palm Springs Wastewater treatment plant. Since DWA water recycling began, these wells have shown reduced concentrations of nitrates, as the amount of secondary effluent reaching the groundwater has been reduced.

An additional goal of this project is to reduce nitrate levels further by reclaiming an increased amount of wastewater. DWA will continue to record nitrate levels in order to gauge nitrate reduction efforts.

#### c) Quality of Plant Growth and Aesthetics of Golf Course Lakes

Since DWA supplies its recycled water primarily for irrigation of large turf areas, a positive affect on plant growth and golf course lakes is critical. In the past, the Agency has kept in close contact with golf course and landscape superintendents regarding the affect its recycled water has on their operations.



Reports have indicated that following the addition of recycled water from the Agency's facility, irrigation systems continue to function properly, and the plants have maintained a healthy appearance, while experiencing reduced fertilizer requirements (DWA's recycled water is rich in nitrates which the plants break down and utilize for growth).

The majority of golf courses supplied with recycled water discharge it into manmade lakes, where it is then pumped through the irrigation systems. Conversations with golf course personnel indicate that the lakes have not experienced increased algae growth (or any additional problems) since the introduction of recycled water to their system.

DWA will remain in contact with personnel from the golf courses receiving benefit from the project pipeline as to the affects of the recycled water on course quality and operating costs.

d) Consumer Education/ Public Acceptance

As previously stated in this document, one of the goals set by DWA's Staff and Board of Directors is to expand the use of recycled water within its service area. This cannot occur in the absence of an informed public which embraces the concept of recycling wastewater.

DWA plans to continue reaching out to the public through ongoing presentations to service clubs, landscape personnel, schools, and by distributing written materials regarding its recycling efforts.

DWA has also concluded a ten-year study (1989 – 1999) comparing the performance of selected water efficient trees and shrubs irrigated with tertiary treated and potable water. The results of this study have been published in a booklet entitled, "Ten-Year Research Findings on Selected Water Efficient Ornamental Plants Using Tertiary Treated and Potable Water." This was a cooperative study involving the Coachella Valley Resource Conservation District, and the results are available to the public.

DWA has discussed with our local school board the potential for the inclusion of a curriculum on recycled water as part of the Palm Springs High School Science Education Program. The High School will begin utilizing recycled water for their irrigation within the next few months (the pipeline serving the school was completed in September, 2001), and it is felt that such an educational program at the high school level would be a positive addition to the DWA's recycling efforts.



#### **4. Preliminary Plans and Specifications, and Certification Statement**

As described on page 20 of this document (Task List and Schedule), project planning is in the finalization stages and therefore work has yet to commence on the plans and specifications. It is estimated that formal design will begin by approximately May 2002. The Agency will submit copies of all plans and specifications as they become available.



### **C. Qualifications of the Applicant and Cooperators**

Portions of this project will be performed in-house (planning, design concept, contract administration), with the remaining work (environmental process, plans and specifications, project inspection) handled by the Agency's Consulting Engineers, Krieger & Stewart, Incorporated of Riverside, California.

- 1) Biographical information for key Agency personnel is included in Appendix 6.
- 2) As stated above, Krieger & Stewart, Inc., will be involved in a significant portion of the is project. Krieger & Stewart have served as the Agency's sole consulting engineers since 1971. They have extensive knowledge of the Agency's needs, and have performed impressively throughout our relationship.

Information regarding Krieger & Stewart's services is contained in Appendix 7.

- 3) The pipeline and reservoir installations, along with all recycling plant modifications, will be performed by independent contractors possessing the necessary qualifications and licenses.



## **D. Benefits and Costs**

### **1. Budget Breakdown and Justification**

#### **a) Land Purchase/Easements**

Budget Amount: \$120,000

The majority of this project will be constructed within improved streets or existing unimproved traveled ways. Some easements may be required, along with a land purchase for the reservoir site.

#### **b) Planning/Design/Engineering**

Budget Amount: \$305,040

Some planning, design and engineering will be performed in-house, with the highest percentage done by the Agency's Consulting Engineers, Krieger & Stewart, Inc., of Riverside, California. This amount covers these costs.

#### **c) Materials/Installation**

Budget Amount: \$2,644,445

The majority of the installations and required modifications will be performed by an independent licensed contractor(s). This amount covers these costs.

#### **d) Structures**

The installation of a 2.0 MG storage reservoir is included with the project. The amounts required for its construction are contained in Item C (above) - Materials/Installation.

#### **e) Equipment Purchases/Rentals**

Budget Amount: None

DWA does not anticipate the need for any equipment purchases or rentals in conjunction with this project.



f) Environmental Mitigation/Enhancement

Budget Amount: None

Environmental mitigation or enhancement measures are not expected to be a component of this project.

g) Construction/Administration/Overheads

Budget Amount: Included in Items Listed

The Agency calculates its overhead amounts for contract work as fifteen percent (15%) of the contract cost. The applicable overheads are included in each budget amount shown. Construction and administration costs are included in above Items c and h, respectively.

h) Project/Legal/License Fees

Budget Amount: \$30,040

The Agency's Consulting Engineers will aid in the administration of the contract(s). Agency attorney involvement will be necessary as this project involves the acquisition of real property and easements. The Agency will also employ its attorneys to address environmental concerns associated with the reservoir placement.

i) Contingency

Budget Amount: \$537,000

Contingency amounts are required: contingency amounts are included in the DWA budgeting process as a means of covering unforeseen expenses or changes which could be encountered during the course of the project. These include possible price increases, construction change orders, and similar scenarios. Contingency amounts usually equate to approximately 15% of the budget amounts.



j) Other

(1) Engineering Services During Construction

Budget Amount: \$300,475

This amount primarily includes inspection services required during the course of construction, which will be performed by the Agency's Consulting Engineers, Krieger & Stewart, Inc.

(2) Permits and Fees

Budget Amount: \$63,000

This amount includes the permit costs imposed by the City of Palm Springs and Riverside County Flood Control and Water Conservation District to construct the project within dedicated street right-of-ways and in the Palm Canyon Wash.

**Total Budgeted Costs: \$4,000,000**



## 2. Cost Sharing

This section is not applicable as Desert Water Agency does not propose to utilize cost-sharing as a source of funding.

## 3. Benefit Summary and Breakdown

### a) Quantifiable Project Outcomes and Benefits:

	OUTCOME	BENEFIT
1)	Reduction in groundwater overdraft within service area	Recycled water usage by the three existing golf courses associated with this project will result in a reduction in groundwater overdraft of 1,177 acre feet per year, based on historical usage
2)	Reduction in electricity consumption	Well operations consume approximately 4 times as much power to pump an equivalent amount of groundwater
3)	Reduction of nitrates reaching groundwater table	Agency compiled data indicates reduced nitrate levels in wells near the City of Palm Springs wastewater treatment plant since DWA tertiary recycling began. The amount of benefit expected from the proposed project is not quantifiable
4)	Reduction in customer operating costs	Connection to DWA's recycled water system is forecasted to reduce private well operating costs and golf course fertilizer requirements. Estimates indicate that this will reduce customer costs by \$11.00/Af of water (\$131 - \$120)

### b. Non-Quantifiable Outcomes and Benefits:

	OUTCOME	BENEFIT
1)	Increased public awareness	General public will receive increased recycled water education through DWA community outreach programs





#### 4. Assessment of Costs and Benefits

- a) The following assumptions were used in calculating the projected net income for DWA recycled water operations:
- 1999/2000 are actual figures
  - Reclamation rate + \$0.34/100 C>F> (\$150/A.F)
  - Reclamation production assumes addition of Palm Springs High School in 2000/01, Ritz-Carlton 2001/02, and Canyon South 2002/03
  - Depreciation expense is actual cost (25 years) assuming new capital additions of \$500,000 for PS High School, \$3,200,000 for Ritz, and \$4,400,000 for Canyon South
  - Expenses assume an annual 2% increase except for maintenance of filters, reservoirs (tanks), power, chemicals, and depreciation
  - Power costs assumes a 37% increase in 2001-02, a 25% increase for 2002-03, a 10% increase in 2003/04, a 3% increase every year thereafter
  - Chemicals cost assumes a 41% increase in 2001-02, a 25% increase in 2002-03, a 2% increase every year thereafter
  - Maintenance of filters to be done every 10 years
  - Maintenance of tanks to be done every 15 years (2 effluent reservoirs)
  - Total capital expenditures from 1988-89 through 2003-04 = \$20,540,877
- b) All amounts used in projecting net income are in year 2001 dollars, excepting year 1999/2000, which are actual figures.
- c/d) See Appendix 5 for a listing of all projected Costs and Revenues.



e) Cost Effectiveness of Project

Projected net income, as shown in Appendix 5, indicates net losses through the year 2020. The Agency does not charge customers the required amount to meet expenses, as there would be no cost savings or incentive to use reclaimed water, since it would be more economical to utilize private well operations. Efforts are underway, however, to reduce operating costs, which will bring these figures closer in line.

Despite the cost difference, Desert Water Agency feels it is in the best interest of the public to retain the price of recycled water at just under one-half its domestic rate, and strive to reduce operating costs, while realizing economies of scale as more customers come on line. Furthermore, Desert Water Agency's water recycling facility has a current capacity of 10-million gallons per day, and additional revenue from the proposed developments is not a requirement for its continued operation.

Keeping the cost of recycled water low allows it to be competitive with that of private well operations; this serves as an incentive for customers to connect to the recycled water system, thereby reducing the demand on the aquifer.

The Agency's staff and Board of Directors have placed the utilization of recycled water for irrigation purposes as the prime component in reducing its groundwater overdraft condition. All involved with the project are fully aware that in monetary terms, the costs exceed the benefits.

The wealth of DWA's recycling efforts, however, cannot be gauged singularly on that basis. It is only when the reduced reliance on local groundwater, coupled with the potential for improved groundwater quality, are factored in that this project becomes justified.



**E. Outreach, Community Involvement and Acceptance**

Desert Water Agency staff has met extensively with representatives of the Agua Caliente Band of Cahuilla Indians regarding this project. The tribe also supports the use of recycled water for irrigation in lieu of potable water.

Other community outreach measures are detailed in Section 3 - d, page 22 of this document.

Letters of support for DWA's use of Proposition 13 funds in order to expand its use of recycled water are contained in Appendix 8.



## **A. Matching Funds Commitment Letter**

The Desert Water Agency will provide an institutional cost-sharing agreement (letter) signed by our General Manager to commit this Agency to all or part of the matching share, or a letter authorizing third party, in-kind contribution signed by an official authorized to commit the third party, at the time funds are granted by the Department of Water Resources



## **B. Resolution**

Prior to the execution of the contract, the Desert Water Agency will provide a resolution from our Board of Directors in which funds area accepted and in which a representative from the Agency is given authorization to execute the contract and sign requests for disbursements.



### **C. Environmental Documentation**

Prior to the disbursement of any funds, the Desert Water Agency will provide documentation that this project complies with environmental laws and regulations and that necessary permits have been obtained.



## **General Manager/Dan Ainsworth**

Dan M. Ainsworth Desert Water Agency's General Manager, and has been employed with the Agency for approximately twenty three years. Mr. Ainsworth has served in his current position for four years; prior to advancement to his current position, he served as Assistant General Manager for approximately twelve years, and the Accounting Supervisor for approximately eight years. Additionally, Mr. Ainsworth worked part-time for the Agency in the Construction Department, and has had first-hand experience in the field with respect to the construction, installation and maintenance of Agency pipelines. Mr. Ainsworth's current position entails the oversight of all functions of the Agency at all levels (internal, local, county and state). Mr. Ainsworth's previous position as Assistant General Manager required the oversight of all financial functions of the Agency (including preparation, administration and implementation of the budgets, investment transactions, benefit coordination, rate and fee structures, etc.) Additionally, Mr. Ainsworth was appointed by the County to serve on the Riverside County Investment Oversight Committee, which is a committee developed to review and audit the County's finances and investments; Mr. Ainsworth also serves on the State Water Contractor Audit-Finance Committee, as well as the ACWA-JPIA Insurance and Personnel Committee.

## **Assistant General Manager/David Luker**

David K. Luker is the Assistant General Manager for the Desert Water Agency, and has been employed with the Agency for nine years. Mr. Luker is responsible for overseeing the engineering, construction, maintenance and operations of the Agency's facilities, and he plans, organizes, coordinates and directs all Agency engineering activities. Included in those activities is: long range planning and development; review of plans and specifications for Agency facilities and pipelines; coordination of development and operation of the domestic water system, the sewer system, wastewater treatment, and hydro-electric power generation; oversees the administration and performance of Agency laboratory for water quality regulatory monitoring and compliance; system sampling and backflow testing/maintenance oversight; oversees the operations of the Accounting, Customer Service, Information Systems, and Secretarial Departments; advisor to the General Manager; directs the preparation of the annual budget; oversees personnel matters. Prior to Mr. Luker's employment with DWA, he was a partner with Krieger & Stewart Engineering in Riverside for 13 years. In addition to his regular engineering assignments, Mr. Luker served as an expert witness in a number of engineering related areas; worked in service as the City Engineer for a client, and was one of the key Engineers who designed the Agency's wastewater reclamation plant, as well as numerous pipelines and Agency facilities. Mr. Luker also worked as an Engineering Technician for Rancho California Water District and designed pumping plants, water pipelines, sanitary sewer and other related civil works. Mr. Luker is a Registered Civil Engineer - California No. 36810 (1983), Registered Civil Engineer - Oklahoma No. 18025 (1996), Professional Land Surveyor - California No. 5744 (1987), and Certified in Health and Safety for Hazardous Waste Workers (1992).



## **CONSULTANT INFORMATION**

### **Krieger & Stewart, Incorporated**

Krieger & Stewart was founded in 1971 by Robert A. Krieger and Julian D. Stewart. We have provided civil and environmental engineering services to numerous public agency clients throughout California, including cities, counties, redevelopment agencies, economic development agencies, water and wastewater agencies, community services districts, parks and recreation districts, airport districts, and school districts. As a result of a corporate decision made by Krieger & Stewart's founders, we have concentrated throughout the firm's history on providing engineering services to public agencies rather than private developers, thus enabling us to avoid potential conflicts of interest in serving our public agency clients.

We currently employ approximately 45 people, including 14 registered civil engineers, three licensed land surveyors, and a supporting staff of graduate engineers, computer aided designers/drafters, secretaries, surveyors, and construction inspectors. Our principals and senior engineers are not just managers, but are always directly involved in the details of each of the projects they oversee to ensure that our clients are provided with the benefit of their experience and expertise.

The firm's principal engineers and corporate officers include:

Robert A. Krieger, President  
Mark E. Messersmith, Vice-President  
Jon C. Reynolds, Vice-President  
Philip E. Strom, Vice-President  
Patrick M. Watson, Chief Financial Officer  
Charles A. Krieger, Secretary

Krieger & Stewart maintains a complete line of technologically advanced engineering, accounting, and word processing computer equipment and software. Our current complement of engineering computer equipment and software includes Pentium II and Pentium III based computers, an Océ 9400 plotting/reproduction system, a Hewlett Packard DesignJet 650C color plotter, a Tektronix 740P color laser printer, AutoCAD 2000 design software with Land Development Desktop, H2ONET hydraulic network modeling software, and Primavera SureTrak project management software. We also subscribe to computer literature databases maintained by the American Society of Civil Engineers and American Water Works Association, and a property and land use database maintained by First American Real Estate Solutions.

The firm also maintains a large inventory of advanced surveying and field test equipment. Krieger & Stewart's current complement of surveying equipment includes





Geodimeter System 4000 robotic servo-driven total stations, Geodimeter 440 total stations, Geo-Dat 400 data collectors, and precision levels. The firm's surveyors and surveying equipment are transported in 3/4 ton 4 wheel drive service body trucks. Field test equipment available to Krieger & Stewart engineers and inspectors includes an Esterline Angus Power Master III power monitor, a Cox swivel pitot velocity set, Cox Hall pitot tube assemblies, Teledyne Gurley pygmy and basic current meter/indicators, a Cox Hall flow meter, Teledyne-Gurley pygmy and basic stream current meter/indicator, various types of well water level sounders, Rossum sand test kits, well drilling mud test kits, Gastech GX-86 gas detectors, Schonsted metal detectors, and Goldak/UDSCE TR-5 terrasonic pipe locators. The firm's construction engineers/inspectors and field test equipment are transported in 1/2 ton utility pickups, each of which is equipped with levels, tripod, and rod, along with other quality control devices and equipment.

We have extensive experience in providing engineering services for public works projects. In providing these services, we emphasize the use of experienced staff and appropriate equipment, and pay close attention to details throughout the environmental review, planning, permitting, design, and construction phases of project implementation.

Our experience includes providing engineering services related to the following:

- Planning, including Master Plans, Feasibility Reports, Annexations, and Reorganizations
- Environmental Documents for Compliance with the California Environmental Quality Act (CEQA) and the National Environmental Policy Act (NEPA)
- Right-of-Way and Site Acquisition
- Water Rights
- Environmental Permit Acquisition
- Design and Construction Surveying
- Design and Construction Engineering for Water and Wastewater Conveyance, Storage, Treatment, and Pumping Facilities, as well as Hydroelectric Power Plants
- Design and Construction Engineering for Storm Drainage, Road, and Highway Improvements
- Rate Studies for Development of Fees and Charges
- Project Financing, including Loan Applications, Grant Applications, and formation of Assessment Districts
- Water, Wastewater, and Stormwater Quality
- Plan Checking

We have also provided District and City engineering and/or primary consulting engineering services to numerous clients. Services provided have included studies, plan checking, budget preparation, project planning, master planning, preliminary design



studies, design and construction engineering for capital improvement projects, surveying, permitting liaison to regulatory agencies, financing assistance, presentations to governing boards, and general consulting. Agencies to which Krieger & Stewart is currently providing the aforementioned services include:

- Cabazon County Water District
- City of Colton
- Desert Water Agency
- Indian Wells Valley Water District
- Rubidoux Community Services District

Krieger & Stewart has been in continuous operation since 1971 and has established a solid financial foundation. We maintain professional liability, general liability, automobile, excess, employer's liability, and workers' compensation insurance; see Table I-1 for detailed information regarding our coverage.

